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ABSTRACT

Part of a larger project to design a production curriculum and measure the impact of this production activity on children's writing, visual thinking, and problem solving skills, a project developed an effective but inexpensive video for use in teaching animation processes to students at the elementary school level. The project used "cutout" or paperdoll animation--a simplfied form of cartooning that allows the same drawing to be used over and over--to dramatize a short script (an adaptation of a Scottish fairy tale, substituting aliens from outer space for fairies), and the animation was filmed on 8mm film. Audio production involved the taping of character voices and other story sounds. Both the film and the audio were then transferred to video tape for editing. The project took six weeks to complete, and had a total budget of $200. A showing of the first edit was well-received by a sample audience (five children ages 9-12), who were curious about how the video was made and interested in making one of their own. (One table of data is included, and 17 references are attached.) (SR)

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SERENDIPITY IN PAPERDOLL ANIMATION:LOW BUDGET METHODS FOR A CHILDREN'S WORKSHOP

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SERENDIPITY IN PAPERDOLL ANIMATION:LOW BUDGET METHODS FOR A CHILDREN'S WORKSHOP

BACKGROUND

Production and visual education

The purpose of this project was to develop an effective but inexpensive example video for use in teaching animation processes to students at the elementary school level. This is one part of a larger project designed to test the effectiveness of production activity in visual education curricula (visual literacy). The purpose of the larger project is to design a production curriculum at the elementary level and measure the impact of this production activity on children's writing, visual thinking and problem solving skills. Visual education curricula should de-mystify video production technology and, in doing so, help children develop visual thinking skills and become more informed, critical viewers of television.

While it is recognized that elementary school children may watch as much as 29 hours of television a week (Comstock, 1978), little emphasis is placed on helping young people understand and master the technology that dominates their lives. Anderson (1980) identified four underlying constructs for critical viewing curricula: the intervention construct, which seeks to counteract television's negative influence; the goal attainment construct, which seeks to identify motives for television watching; the cultural understanding

construct, in which television is studied as a guide to the culture; and the visual literacy construct, which emphasizes student activity in production of programs. While schools have been slow to adopt any critical viewing curricula, the visual literacy construct has had the least support in curriculum development (Dorr, 1980). However, children's active involvement in video production should subsume some goals of the other three constructs. Responsible viewing and responsible program production are both integral parts of the communication process. The idea that animation techniques can be taught in a classroom setting as part of visual education curricula is not a new one (Gross, 1975), but, like most video production activity in the classroom, the teaching of animation techniques is rarely adopted. This may be in part because teachers themselves may have minimal training for teaching visual literacy skills or production.

Because the television camera often makes a presentation of literal images, it is difficult for many young children to grasp the fact that the presentation itself is not literal. How young spectators learn to interpret technical aspects of television such as constantly changing shots and angles, interruptions, and multiple perspectives appears to be associated with developing mental skills (Salomon, 1984). The technique of zooming in and out, for example, is similar to the skill of relating parts to a whole. A child who learns to understand changes in camera angles can understand changes in perspective. Exposure to the vernacular of production can improve corresponding mental skills, becoming a step toward mastery of new concepts and areas of knowledge.

Many school systems, such as the one in Greensboro, N.C., have video production facilities. The Weaver Center in Greensboro provides

a television studio and assisting staff for special production activities and some classes. However, these activities generally are reserved for highschool students and tend to be extracurricular. In many instances when elementary school children are involved in video production as part of classroom activity, the projects are often authored by the teacher to accompany "basic curricula" rather than achieve creative or visual literacy goals. While students might become involved in performing, they are often excluded from script development and hands-on production, the kind activity that promotes creative problem solving and visual skills. For example, a history lesson may include a video production about the founding of North Carolina authored by the teacher, performed by students and produced by Weaver Center staff (M. Parrish, personal communication, November 18, 1988).

Some extracurricular projects, such as the student video competition sponsored by the Birmingham International Educational Film Festival do encourage student-authored creative scripts, usually written as part of in-class writing activities. The lure of possible television production of their stories has been a good motivator for young writers, encouraging those who might otherwise be less interested in writing (Edwards, 1988). During production of these scripts, students come upon various problems that call for creative solutions. For example, how to get a flowing brook inside a studio or how to simulate night for an outdoor shoot at three in the afternoon. Animation projects create different problems often involving lighting, scale, and movement that call for equally creative solutions.

Children and animation

Research on children's attention to television has shown that animation is an element children like (Anderson & Levin, 1976; Levin and Anderson, 1976). It is not surprising that animation is a technique which predominates in children's television programming. However, when television brings drawings or inanimate objects to life, children can be even more bewildered by this "literal" medium. Producers of children's cartoons create a diegesis where no real world exists. Questions asked by elementary students in video production workshops are often concerned with animated programs and how animation is accomplished. Children seem particularly interested in learning to animate their drawings, bringing their own worlds to life. Analysis of stories written by sixth graders show that young people like to write science fiction and fantasy subjects that lend themselves to animation (Pierce and Edwards, 1988).

Harrison (1981) described cartoons as "communication to the quick," which may explain some of the reason why they have such appeal for children. As communicators, animated cartoons can have "the advantages of clarity and the disadvantages of distortion" (p. 12). They are innaccurate yet recognizable. Children, like the lucky children and adults who have attended The Yellow Ball Workshop in Lexington, Massachusetts, have the benefit of learning animation techniques (Anderson, 1970) and simultaneously develop abilities to improvise, explore, simplify, analyze, and solve problems. It is relatively easy to animate a cutout of a magician as he makes a rabbit appear from a hat, making things appear and disappear on film or video is no real trick, but everyday movements can pose real problems for an beginning animator to solve. For example, portraying a cutout

character with the hiccoughs can be a real challenge.

Animation uses the same perceptual phenomenon, persistence of vision, that makes film or motion pictures appear to move. It consists of a series of photographic images of inanimate objects or hand-drawn pictures, where one image is followed by another slightly different: the inanimate object is moved a little or the drawing is modified in each successive image. The eye interprets this change as movement. The traditional hand-rendered cartoon takes thousands of hours to produce a few minutes of fluid movement. Computer generated cartoons, such as the National Film Board animation, LaFaim, reduce this production time. Both traditional and computer approaches require sizable budgets (Harrison, 1981) and methods which are not easy to reproduce in a classroom setting or explain to elementary school children. The purpose of this exercise was to develop an inexpensive animated video which could be used in the classroom to demonstrate a simple animation technique, the first step toward helping students write and produce their own animated projects.

METHODS

Preproduction

Independent animators have invented "cutout" or paperdoll animation, which is a simplified form of cartooning that allows the same drawing to be used over and over. Paperdoll animation is not a new idea, but a useful one because of its simplicity (Barton, 1955). The standard set up involves: a camera positioned directly above the background on which cutout figures are animated, a copy stand or tripod to hold the camera steady, and two lights positioned on either

side of the camera to provide even illumination. Animation is achieved by moving figures that have been drawn and cut out, much like paper dolls. This method was chosen over others to develop for workshop purposes primarily because it is an inexpensive method but also because it was believed young children would be familiar with drawing and cutting out objects. The set up is a simple one that can be easily carried to a classroom and assembled. In addition, variations on this technique such as cloth and felt animation have often been used to make simple story films for children (Labourne, 1979), so children would be familiar with the "look" or style of movement this technique produces.

The total budget for this project was $200.

A short script, an adaptation of a Scottish fairytale, was written specifically for this demonstration project. Since analysis of child-authored stories showed that children liked science-fiction and space stories (Peirce and Edwards, 1988), aliens were substituted for fairies and the story was given a contemporary setting. The story was then analyzed for possible sound/visual relationships. A large part of the script can be described as either narrative or dialogue. Although beginning animators are advised to avoid working with lip sync, it was believed that lip sync was necessary for dialogue portions of the script. At this point it was also determined what dialogue would be designed as actual, synchronous, parallel and what would involve the animator in lip sync.

Script analysis was followed by the creation of a narrative design. The design indicated what video would be used to compliment the narrative. Each potential indeme was plotted throughout the script in lieu of a storyboard. However, since storyboard creation is

a good visual thinking device, children involved in an animation workshop would probably be asked to develop a storyboard.

Once the video had been envisioned in some detail the animator and the audio designer worked independently, hoping that pre-production analysis produced a shared, co-ordinated vision. Working simultaneously meant that critical time could be saved in the production process, since the animator wouldn't have to wait for the narrative audio to be completed before beginning the time-consuming process of illustration. In addition, independent production of audio and video might be useful in the classroom setting, if the instructor wanted to divide the classroom into production teams. Small teams of students working on specific parts of the project would help insure that everyone was involved in participant learning and minimize "sitting around." Designs and drawings for establishing shots and characters not involved in lip-sync could get underway at this point.

Audio production

Audio production involved the casting and taping of character voices. A sound track was made of all the dialogue. All the audio for this project was mixed on a multi-channel system, allowing better management of sound levels. Production of the audio atmosphere involved obtaining sound effects such as bird calls, babbling brooks, etc. These audio effects were used to create "sound collages," sound overlays designed to create specific aural sensations to augment the visual image and narrative audio. In the classroom setting, one group of students might be assigned to produce the audio for the project. This might involve creating and recording original music and sound

effects as well as voices. A simple audio cassette recorder is sufficient. The sound can later be transferred to either or both tracks of the master video tape.

The audio on the demonstration project was mixed electronically, transferring audio from track to track as each scene was constructed. The completed narrative audio was then transferred to both audio channels of 3/4 inch video tape. In the full-cel techniques used by commercial studios the final audio mix would have been transfered to magnetic tape type 35mm film. Although animation has been traditionally produced in film, the decision was made to transfer this project to video tape for editing largely because of the ease of marrying sound to image and the fact that a video editing facility was available at low cost.

Art and animation

The method employed by the animator combined movement of three dimensional objects, and paperdoll or "cutout animation" (Laybourne, 1979). The design of the characters was simple, similar to children's drawings. The characters were sketched on heavy paper and painted with egg tempra, then cutout so they could be moved on clear acetate suspended above a background; this caused the cutout to cast shadows on the background, creating a three-dimensional effect. Facial features, limbs, etc. were drawn separately and added to the basic character figure to allow more detailed movement. For example, arms were drawn and cut out separately so they could be moved against the torso of a figure. Eyeballs were drawn and cut so they could be moved around in the socket. Some animators use clips or fasteners to align figure parts, but because of its simplicity, gravity was used in this

project. Gravity as an alignment device provided more freedom; each part of a figure could be moved independantly. However, this also invited unplanned for movements, since a breeze, a sneeze or a bump could unintentionally move figure parts.

A camera operator photographed each image in sequence using a super 8 film camera suspended above the cutouts on a tripod. The animator generally made two exposures per movement. Again the strict budget dictated decision-making regarding the use of 8mm film. Thirty-five or 16mm film might have been technically preferable, affording better color resolution, but 8mm was considered best for workshop purposes. (Consumer grade super 8 is inexpensive and easy to use. If manufacturers decide to discontinue producing super 8 products, this could have an adverse effect not only on programs like this proposed workshop, but highschool and college film programs and other production programs limited to a strict budget.)

Each sound indeme involved in lip sync was timed and phonetically transcribed so the animator could determine lip positions and the number of camera exposures necessary for each sound. Exposures for lip movements followed the guidelines provided in Heath (1975). The film was then processed and transferred to video tape for editing.

Original cutouts were kept after filming for later use in demonstrating the technique.

Editing

The project was edited in facilities at the South Carolina Fine Arts Commission, which makes an A-B roll editing suite available to independent producers at minimal costs. Dissolves were used in several sequences in the project to give feeling of time lapse and

provide additional movement. True lip sync was difficult to achieve in the video edit, because the actual "take" of edit poits is imprecise, plus or minus two frames. However, it was possible to "still" frames, allowing the editor to stretch source materials. Video editing also made visual loops possible, movements such as the clapping of a baby could be repeated, making frugal use of source materials.

Video editing of classroom projects will most likely be limited to the 1/2 inch single source edit bays available for public school use, or projects will have to be edited for students in conjunction with a field trip to the post-production facility so students can see how the process works. If classroom teachers haven't the expertise to edit video, the school's video facility usually has a person on staff to help with this part of the production. Another possible alternative for schools is to make use of the local access facility. In some communities cable systems provide a simple studio and post-production facility and a staff that can explain the operations of the equipment. There is a bonus in using the local access channel. Final products can be cable cast for parents and friends to see.

Viewing

The first edit of the demonstration project was shown to a group of five self-selected children (ages 9-12) to determine whether the video held their attention. In an interview afterward, children were asked questions about the story to see if it held their attention, whether or not they liked the story, and whether or not they would be interested in making one.

RESULTS

There were numerous problems encountered in production similar to difficulties that might be anticipated in a classroom exercise. These included: a dragging aperature on a borrowed 8mm film camera, slipping of the camera position due to loose adjustments on the borrowed tripod, inexact color match in the film to video transfer, and unplanned movements of cutouts due to the use of gravity as an alignment device. The project took six weeks to complete.

In spite of many problems associated with borrowed equipment and the cutout technique, the final project was completed on time and under budget (see Table I). A showing of the first edit was well received by a sample audience, though lip-sync portions received the most attention. According to one girl, the "parts where people talked" made the project seem less like a video storybook and more "alive." Some of the children found the unintended movements of characters amusing. All of the children (except the nine-year-old) were curious about how the video was made and were interested in making one of their own. All of the children were able to explain what had happened in the story.

Scenes involving the professor in his laboratory were the least successful with this audience. This was largely due to the language the professor uses. Scenes involving aliens were the most successful.

One of the limitations of this technique is that it is not as effective as some animation techniques, such as line drawing or cel animation, for portraying subtle movements and is better for plots with broad action. For example, plots involving internal character

conflict signified indirectly through facial expressions would be difficult to portray using cutout technique.

The next step in this project is to actually bring the example video and the technique for making it into classroom use and measure the impact of this production activity on children's writing, visual thinking, and problem solving skills.

CONCLUSIONS

There is an abundance of evidence regarding the negative effects of television on children's socialization, creativity, and writing skills. Yet schools are slow to adopt visual literacy curricula and research on the effectiveness of this curricula at the elementary school level is rare.

Laybourne (1979) described the visual thinking necessary for development and production of an animated project as a form of problem solving and communication that is quite different from verbal thinking, the kind of thinking most valued by formal education. The value of bringing this production exercise into the classroom is that it requires both visual and verbal thinking in the development and writing of stories and scripts and visual thinking and the use of group and interpersnal communication skills in the production of those scripts.

Writing and production for television and film requires an understanding of both technical and aesthetic factors. The technical factors involve learning how equipment operates and the technical limits of equipment. Aesthetic factors involve an understanding of how the visual components of a production are manipulated to capture

an audience, and to inform, entertain or persuade that audience. Children can learn concepts and skills from these video making experiences that will be useful in understanding communication in general, the most subtle and challenging of responsibilities.

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PROJECT BUDGET SUMMARY

PREPRODUCTION

Screenplay	0.00
Casting	0.00
Paints, posterboard, art supplies	$ 10.00
	$ 10.00

PRODUCTION

3 Sony KCS 20 BRS	30.00
Film to video transfer	35.75
Filmstock and processing	49.00
Audio stock	0.00
Camera equipment rental	0.00
Sound equipment	0.00
total	114.75

POSTPRODUCTION

Editing	38.00
Titles	0.00
TOTAL	$162.75